

1

FLEXIBLE VERTEBRAL SPACER**CROSS REFERENCE TO RELATED APPLICATION**

This application is a divisional application of U.S. patent application Ser. No. 12/760,956, filed Apr. 15, 2010, which claims benefit to U.S. Provisional Application Ser. No. 61/169,453 filed Apr. 15, 2009, herein incorporated in their entireties by reference.

TECHNICAL FIELD

This disclosure relates generally to an interbody spacer and instrumentation, and in particular relates to a flexible spacer, instrumentation and methods for implanting the flexible spacer along a non-linear surgical path.

BACKGROUND

Human intervertebral discs generally serve two functions, they cushion and allow movement between two adjacent vertebrae. The cushioning is performed by a gel-like material, which forms the inner part of the discs. These discs are known to deteriorate with age, injury, or disease. When discs are damaged or diseased, the mobility of the subject is often impaired and great pain may result from movement. Damaged discs may also place pressure on the spinal column, causing additional pain.

To relieve the pain associated with disc injury and disease, it has been known to remove the diseased or damaged disc from the intervertebral space, and fuse or otherwise join the adjacent vertebrae that define the intervertebral space. Fusion is often desirable because it serves to fix the vertebral bodies together to prevent movement and maintain the space originally occupied by the intervertebral disc.

Interbody spacers are commonly used to promote fusion in an intervertebral disc between two vertebrae. Common surgical approaches to the disc require a linear “line-of-sight” insertion path L_{IF} (See FIG. 1) that is in-plane with the disc to be fused, in order to accommodate the instruments to prepare the disc space and the linear delivery of the interbody spacer into the disc space.

Traditionally, surgical techniques involved a posterior or anterior approach through the subject to the desired intervertebral disc space. However, the posterior and anterior approaches require careful measures to be taken to avoid vascular tissues along the insertion path. Failure to do so can result in the formation of scar tissue on the vascular tissues. As a result of this and other difficulties with posterior and anterior approaches, a new lateral approach technique was developed.

The new lateral approach to the spine, which is gaining popularity for fusion procedures, allows the surgeon to gain access to the desired intervertebral disc space from the patient’s lateral side. The lateral approach generally allows a more complete preparation of the disc space, including a more thorough and complete removal of the original disc material, compared to a posterior approach. A lateral approach also limits access-related surgical trauma and exposure to certain neurological, vascular and other structures while surgically accessing the disc space. Additionally, this improved access allows a larger interbody spacer to be inserted. However, a limitation of the lateral approach is that it is difficult to access the commonly-pathologic L5-S1 lumbar disc due to the patient’s iliac crest obstructing the line-

2

of-sight surgical approach. Accessing the L4-L5 space can also prove difficult using a lateral, linear (or line-of-sight) approach.

SUMMARY

A system is provided that allows a surgeon to deliver an interbody spacer into a disc space when a direct line-of-sight approach to the disc is difficult or obstructed, such as for fusing the L5-S1 lumbar disc via a lateral surgical approach. The system can include an interbody spacer and a guide rail instrument. The flexible interbody spacer (also referred to herein as a “flexible spacer”, “interbody spacer” or “spacer”) can be delivered along the guide rail instrument into a desired intervertebral disc space using a non-linear approach.

In accordance with one embodiment, an implant system is configured to position a flexible spacer between adjacent vertebrae. The implant system includes a flexible interbody spacer including a spacer body that defines a central axis, a lateral axis extending perpendicular to the central axis, a top surface extending substantially parallel to the central axis and a plurality of hinge sections that permit the interbody spacer to flex, the interbody spacer including a mating surface extending along a side surface generally parallel to the central axis. The implant system further includes a guide rail including a guide rail body that defines a proximal end, an opposed distal end, and a track extending between the proximal end and the distal end along a non-linear path. The engagement member is slidably engagable with the track to guide the flexible interbody spacer from the proximal end to the distal end along the non-linear path.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing summary, as well as the following detailed description of preferred embodiments of the application, will be better understood when read in conjunction with the appended drawings. Preferred embodiments and features of the flexible implant, related instruments, and surgical methods of the present application are shown in the drawings. It should be understood, however, that the application is not limited to the precise arrangements and instrumentalities shown. In the drawings:

FIG. 1 is a side elevation view of a flexible implant mounted to an insertion instrument in accordance with a first preferred embodiment of the present invention, wherein the flexible implant is shown in a first implantation position and the insertion instrument is mounted to an L5 vertebra;

FIG. 2 is a side elevation view of the flexible implant and insertion instrument of FIG. 1, wherein the flexible implant is in a second implantation position and the insertion instrument is mounted to the L5 vertebra;

FIG. 3 is a bottom perspective view of the flexible implant and insertion instrument of FIG. 1, wherein the flexible implant is in the first implantation position;

FIG. 4 is a rear perspective view of the flexible implant and insertion instrument of FIG. 1, wherein the flexible implant is in the first implantation position;

FIG. 5 is a side elevation view of the flexible implant and insertion instrument of FIG. 1, wherein the flexible implant is positioned slightly off of a distal end of the insertion instrument in a third implantation position;

FIGS. 6 and 7 are side elevation views of the flexible implant of FIG. 1 in a planar position and a flexed position, respectively;